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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/807,298	04/09/2001	Frank Leonard Schadt III	PE0612	5947

23906 7590 06/20/2003

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WILMINGTON, DE 19805

EXAMINER

THORNTON, YVETTE C

ART UNIT	PAPER NUMBER
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1752

DATE MAILED: 06/20/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/807,298

Applicant(s)

SCHADT III ET AL.

Examiner

Yvette C. Thornton

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-34 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 10-15 and 27-33 is/are rejected.
- 7) ☒ Claim(s) 5-9, 16-26 and 34 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 April 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 8-9. 6) ☐ Other: _____.

DETAILED ACTION

This is written in reference to application number 09/807298 filed on April 9, 2001.

Response to Amendment

1. Claims 1-34 are currently pending.
2. The amendment filed on March 24, 2003 has been entered and fully considered.
3. The examiner notes that the said amendment suggests that instant claims 1, 13 and 27 have been amended. The examiner has found no difference between the pending claims and the "amended" claims. Clarification is requested.
4. The amendment to instant claim 17 is sufficient to overcome the claim objection set forth in the previous office action.
5. The examiner hereby withdraws the rejection of the instant claims over 35 USC 112, 2nd paragraph in light of the applicants' explanation of the claimed invention in paper number 7.

Information Disclosure Statement

6. The Information Disclosure Statements filed on March 24, 2003 and April 14, 2003 have been entered and fully considered.

Claim Interpretations

7. The examiner has interpreted the instant claims as referring to a photoresist composition comprising a branched type polymer having a linear backbone and sidearms, which have at least two repeating units and a Mn of at least 1000 and a photoacid generator.

Specification

8. The amendment filed March 24, 2003 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: the changing of the word "acid" to "hydroxyl" on page 17, line 17 constitutes new matter. The deletion of the phrase "Digital imaging with a laser is preferred" on page 20, line 13 of the specification also constitutes new matter.
9. Applicant is required to cancel the new matter in the reply to this Office Action.

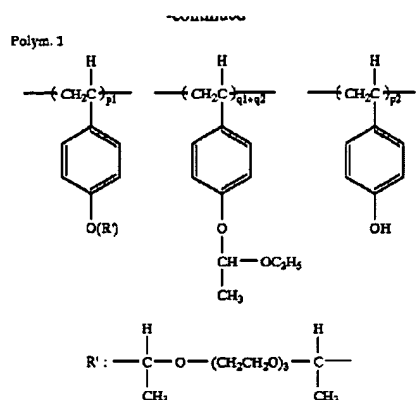
Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

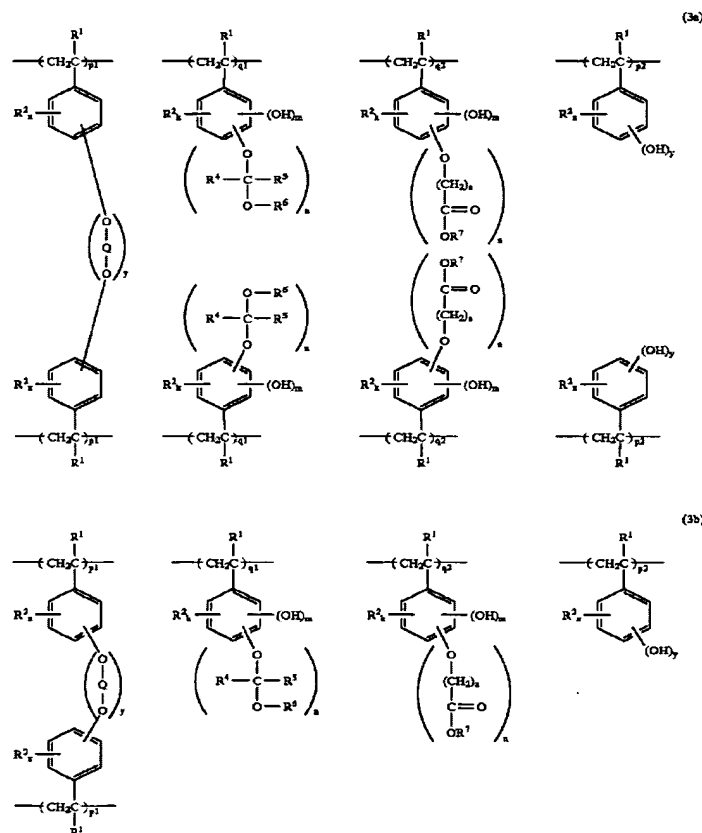
A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1-4, 10-15 and 27-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Watanabe et al. (US 5,942,367 A). Watanabe exemplifies in example 20, a resist composition comprising a polymer, a photoacid generator, a dissolution controller, a basic compound and a solvent mixture of propylene glycol methyl ether acetate (PGMEA) and cyclohexanone (CH) (see also ex. 1-19 and 21-27). The said polymer has the structure:



the said polymer would crosslink to form an intermolecular linkage or an intramolecular linkage such as those represented by formula (3a) or (3b), below (see c. 25, l. 40-c. 30, l. 13).



Preferably the amount of the acid labile group and the crosslinking group combined is on the average more than 0 mol% to 80 mol%. By properly selecting the amounts of the

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crosslinking group having a C-O-C linkage and the acid labile group with in the taught range, the size and configuration of a resist pattern can be controlled as desired (c. 29, l. 26-35). It is the examiner's position that the taught polymer meets the limitations of the instant claims wherein the crosslinking process introduces branches onto the polymer backbone, which have repeating units. The exemplified photoacid generator, dissolution controller and solvent meet the limitations of the claimed photoacid generator, dissolution inhibitor and solvent of instant claims 1, 15 and 31, respectively.

Watanabe further exemplifies a process wherein the composition of example 20 was spin coated on a silicon wafer. With the wafer rested on a hot plate, the coating was pre-baked for 90 seconds. The formed film was exposed to light by means of an excimer laser stepper through a mask having a desired pattern, baked at 110°C and developed with an aqueous solution of TMAH for 60 seconds to produce a positive pattern (c. 88, l. 1-12).

Watanabe teaches that the taught composition is best suited for fine patterning with actinic radiation especially radiation having a wavelength of 254-193 nm such as deep UV, excimer laser light, X-ray or electron beam (c. 76, l. 53-c. 77, l. 26). One of ordinary skill in the art would readily envisage a process wherein the exemplified composition is exposed to deep UV light.

Allowable Subject Matter

12. Claims 5-9, 16-26 and 34 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

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13. The following is a statement of reasons for the indication of allowable subject matter: review of the prior art failed to teach and/or suggest a photoresist composition as set forth in instant claims 5 and 6 wherein the photoacid generator is covalently bonded to the branched chain; a branched polymer comprising acrylate polymer, methacrylate polymer or combination thereof as in instant claims 9, 16 and 34; or a fluorine-containing copolymer in combination with a photogenerator as set forth in instant claims 17 and 21. Fluorinated compounds are known in the art however, the examiner failed to find a reference with had a filing date which was citable as prior art. The examiner directs the applicant's attention to US 2001/0018162 A1 and US 2001/0010890 A1.

Response to Arguments

14. Applicant's arguments with respect to the instant claims have been considered but are of little moment in view of the new ground(s) of rejection.

Conclusion

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Takeda et al. (US 6,156,481 A) pertaining to a positive resist composition. The examiner notes that the said reference is not considered prior art due to a later filing date than the present application.
- Shimada et al. (US 6,033,828 A) pertaining to partially hydrogenated polymers and chemically amplified positive resist compositions.
- Kodama et al. (US 5,891,603 A) pertaining a positive working resist composition.

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16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yvette C. Thornton whose telephone number is 703-305-0589. The examiner can normally be reached on Monday-Thursday 8-6:30.

17. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet C. Baxter can be reached on 703-308-2303. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

18. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-1495.


Yvette Clarke Thornton
Junior Examiner
Art Unit 1752

yct
June 16, 2003